AMENDMENTS TO THE SPECIFICATION:

Please replace the Title at page 1, line 1 with the following title:

Electrical Adaptation Network with a Transformation Line

Please delete the word "Specification:" at page 1, line 4.

Please add the following centered heading at page 1, line 5:

TECHNICAL FIELD

Please add the following centered heading at page 1, line 15:

BACKGROUND

Please add the following centered heading at page 3, line 19:

SUMMARY

Please add the following centered heading at page 9, line 4:

DESCRIPTION OF THE DRAWINGS

Please add the following centered heading at page 9, line 14:

DETAILED DESCRIPTION

Please replace the Abstract on page 19 with the following new Abstract:

A network for electrical matching of an electrical component is disclosed. The network includes a first conductor plane and a second conductor plane separated by a ceramic intermediate layer. The network also includes a transformation line formed in or on a substrate and having a predetermined electrical length. The transformation line includes a first part having a bent-over configuration and a second part having a bent-over configuration. The first part is disposed in a first plane and the second part is disposed in a second plane. The second part is electrically connected to the first part by an interlayer contact in the ceramic intermediate layer.

Please delete the phrase "Title: Electrical matching network with a transformation line." at page 19, line 5.

Please delete the phrase "(Fig. 6)" at page 19, line 17.

Please replace the paragraph beginning at page 3, line 19 with the following amended paragraph:

Accordingly, ~~it is an underlying problem of the present invention to devise~~ a network comprising a transformation line which can accommodate other miniaturized components and which is capable of achieving a desired matching of better than 10 dB <u>is disclosed</u>.

Please delete the paragraph staring with "This problem is solved..." at page 4, line 1.

Please replace the paragraph beginning at page 4, line 3 with the following amended paragraph:

In some embodiments, ~~According to the invention~~ a network is proposed which has a transformation line formed in or (partially) on a substrate, which transformation line is of a predetermined electrical length. In order to better utilize the area available for laying out the transformation line, the transformation line has at least two parts which are bent-over (e.g. laid out in a Greek fret pattern), each of which parts is disposed in a separate conductor plane, wherewith said parts are interconnected by means of interlayer contacting (through-plating). All parts of the transformation line have conductor segments which have straight line shapes and which are mutually joined [sic] at right angles. Preferably, all parts of the transformation line are comprised of segments which exclusively have straight line shapes and which preferably are mutually joined at right angles.

Please replace the paragraph beginning at page 4, line 17 with the following amended paragraph:

The particularly compact, space-saving layout of the conductor in bent-over patterns (e.g. Greek fret patterns), wherewith conductor segments disposed in different conductor planes partially overlap, gives rise to cross-coupling. This cross-coupling tends to be inherently disadvantageous, but is exploited ~~according to the invention~~ for adjusting the required electrical

properties (the predetermined phase shift and the impedance) of the transformation line. In contrast, with known transformation lines, e.g. transformation lines distributed over two planes, the overlapping areas of conductor segments are intentionally kept to a minimum, wherewith the only overlapping is at unavoidable crossing loci of mutually perpendicular segments, and overlapping of mutually parallel conductor segments is avoided.

Please replace the paragraph beginning at page 5, line 5 with the following amended paragraph:

The ~~inventive~~ network is preferably integrated in a multi-layer component which has a plurality of conductor planes subsumed in the substrate structure, wherewith the matching of the transformation line for a given operating frequency is achieved, and wherewith at this frequency the transformation line converts, e.g., an open circuit at its first end to a short circuit at its second end.

Please replace the paragraph beginning at page 5, line 9 with the following amended paragraph:

According to some embodiments, ~~an advantageous variant of the invention,~~ the widths of conductor segments in at least one of the conductor planes are different. By appropriate changes of the widths of individual conductor segments, one can influence the capacitive cross-coupling and the impedance of individual conductor segments; thus by appropriate choice of the conductor widths of individual segments one can achieve the desired matching of the conductor

impedance. E.g., if one considers two conductor segments which have mutual capacitive and inductive coupling, one can, e.g., reduce the inductive coupling by increasing the width of one of the conductor segments. Moreover, in the same way, by increasing the width of one of the conductor segments, one can increase the parasitic capacitive coupling to neighboring conductor segments (which coupling tends inherently to be detrimental). Thus, by varying the conductor width of a single conductor segment, one can improve the electrical matching of the transmission line. By suitable independent choices of widths of all of the various conductor segments, the matching can be optimized and can be adjusted exactly to a desired value. Typical circuit environments may necessitate, e.g., impedance matching at 50 Ohm.

Please replace the paragraph beginning at page 6, line 1 with the following amended paragraph:

The disclosed system, device, and/or method ~~invention~~ enables one to optimize at the desired values, by easy and simple means, electrical matching of the transformation line, and thereby the matching of the entire network for matching of the electrical component of interest, without occasioning a need for increased space to accommodate the transformation line. The ~~invention~~ disclosed system, device, and/or method facilitates hookups which if attempted with known transmission lines would lead to inadmissibly high cross-coupling and thereby to poor matching. This capability ~~according to the invention~~ enables further reduction of the required space for accommodating the transmission line, and (alternatively or additionally) enables the transmission line to be configured in a geometric shape which previously was impossible without

introducing additional drawbacks allowing ~~. Thus the invention allows~~ one to better utilize the area available on a given substrate. In some embodiments, ~~With the invention~~, there is no need for additional space because ~~with the invention~~ the geometric length and as a rule also the electrical length of the conductor, which length is a determining factor in the phase shift, are not appreciably changed.

Please replace the paragraph beginning at page 6, line 17 with the following amended paragraph:

The ~~inventive~~ transmission line can be realized with a conductor which has a bent-over configuration in each of two conductor planes (this arrangement is also known with customary transmission lines). The two conductor planes are separated by an insulator which preferably is a ceramic layer. Each conductor plane may be separated from an associated grounded planar shielding plate by another insulating layer, which also may be a ceramic layer.

Please replace the paragraph beginning at page 7, line 1 with the following amended paragraph:

The transformation line may be in the form of a "tri-plate" line, wherewith the conductor planes are disposed between two grounded plates. The transformation line ~~invention~~ makes it possible for the insulating layer separating the two conductor planes to be thinner than with known transformation lines. ~~With the invention~~ In some embodiments, the resulting detrimental

cross-coupling is compensated for. The two parts of the conductor which are laid out in different conductor planes are interconnected by through-plating.

Please replace the paragraph beginning at page 7, line 6 with the following amended paragraph:

In the two conductor planes the segments are laid out in a manner such that no parallel segments in the two conductor planes are superposed. Parallel segments in the two planes are offset by at least a minimum distance. Crossings of sectors in different conductor planes are preferably at locations distant from the segment ends, particularly preferably in the middle of the conductor segments. When the conductor widths of individual segments are varied, advantageously certain constraints are adhered to. In particular, the widths of the conductor segments and the separation distances of parallel conductor segments are subject to minimum values which are mainly technologically dictated, and which may be selected at, e.g., 100 micron. These exemplary minimum values of width and separation are ~~not part of the principal claimed matter of the invention, however, but are only~~ mentioned as exemplary constraints which can ~~should~~ be taken into account in the optimization process and which thus will be reflected in the particular configuration of the transformation line which is used in practice. Other constraints and minimum values may be applicable and may be taken into account.

Please replace the paragraph beginning at page 9, line 10 with the following amended paragraph:

Fig. 4 is a schematic plan view of a part of an ~~inventive~~ transmission line. [[;]]

Please replace the paragraph beginning at page 9, line 11 with the following amended paragraph:

Fig. 5 illustrates a Smith chart of the ~~inventive~~ transmission line. [[;]]

Please replace the paragraph beginning at page 9, line 12 with the following amended paragraph:

Fig. 6 is a schematic plan view of two parts of ~~an inventive~~ a transmission line, each of which is disposed in its own conductor plane, wherewith the two planes are superposed one above the other.

Please replace the paragraph beginning at page 10, line 17 with the following amended paragraph:

~~According to the invention~~ In some aspects, the width of individual conductor segments in one or both of the conductor planes (LE1, LE2) is varied, and in particular is increased. In this way, the cross-coupling of the conductor segments (A1 to A6) with neighboring conductor segments in the same conductor plane or in the other conductor plane (conductor plane LE2 disposed below plane LE1 and not shown in Fig. 4) is reduced, and/or is changed in character. For example, by broadening a conductor segment A the inductive cross-coupling can be reduced, while at the same time the capacitive cross-coupling is increased. The widths shown (d3, d4, d5,

d6) of respective conductor segments (A3, A4, A5, A6) are provided merely for purposes of example. The supposed "original" width of a conductor is d0. For optimal matching of the conductor, under normal circumstances the widths dx of all varied conductor segments Ax will have mutually differing values. However, it is also possible that individual conductor segments will have the same width, particularly in the conductor segments which are unchanged with respect to the original structure. Only the conductor plane LE1 is shown in Fig. 4; the second conductor plane LE2 disposed below plane LE1 can be (and is) changed correspondingly, wherewith the conductor segments in that plane also have differing widths.

Please replace the paragraph beginning at page 11, line 10 with the following amended paragraph:

Fig. 5 shows the Smith chart associated with the transmission line illustrated in Fig. 4. It is seen by comparison with Fig. 3 that the electrical matching of the ~~inventive~~ transmission line is significantly improved. It is at approximately 50 Ohm and has a phase shift of, e.g., exactly lambda/4. The magnitude of the phase shift can be changed by appropriately increasing or decreasing the geometric and therefore electrical lengths of the conductor in one or both planes. Thus a phase shift different from lambda/4 is possible.

Please replace the paragraph beginning at page 11, line 16 with the following amended paragraph:

The following is a possible method of optimizing the matching of a ~~an inventive~~ transmission line. One starts with a conductor having segments of equal width, the electrical characteristics of which conductor are calculated or simulated. Then the width of a segment is varied and the electrical characteristics are re-calculated. The effect obtained (shifting of the matching, as a vector in the Smith chart), is stored, as a measurement of the matching corresponding to the change in the segment. Then, beginning with the starting structure, the width of a different segment is changed, and the electrical characteristics are again calculated, leading to a second determination of the matching. Depending on the problem posed, and effects obtained from the individual variations, it may be possible to achieve the desired (or required) matching by interpolating between the effects (and corresponding variations of the widths) of just two individual segments. For more difficult matching situations, it may be necessary to implement additional changes, for other segments or for all segments, and, using the calculated changes in the matching, to arrive at the desired matching via a combination of individual changes. For such a resulting structure, it may be necessary to employ still further adjustments, because individual calculated adjustments may have interactive effects.

Please replace the paragraph beginning at page 12, line 9 with the following amended paragraph:

~~An inventive~~ A network with the novel transformation line can be used for matching of any arbitrary electrical components. It can be advantageously used for passive integrated networks, which is needed for further miniaturization of electrical components. A particularly

advantageous application for the ~~inventive~~ network [is] in electrical matching of components of front-end modules in terminal devices in wireless communications systems, e.g. in mobile telephone handsets. In such applications, the passive integration [sic -- i.e. passive network] must be integrated into the component substrate or front-end module substrate, in order to achieve the desired (or already established) external dimensions.

Please replace the paragraph beginning at page 13, line 3 with the following amended paragraph:

In the present case, an electrically insulating ceramic material is used for the intermediate layer between the two conductor planes (LE1, LE2); the (preferably) low dielectric constant of the ceramic material is a factor in determining the impedance of the conductor. A lower dielectric constant of the intermediate layer also reduces the cross-coupling between the conductor planes. ~~The present invention~~ The arrangement allows such cross-coupling to be minimized, or to be advantageously exploited. Also, the ceramic layer(s) between a given conductor plane LE1 and a shielding plate E1 which shielding plate is connected to ground is (are) selected and disposed so as to be electrically insulating; here again the value(s) of the dielectric constant(s) has (have) an influence. Typically, the same ceramic material will be used for all of the ceramic layers, including the intermediate layer. ~~According to the invention~~ In some embodiemnts, however, it is possible for the intermediate layer to be comprised of a different ceramic material from that of the other ceramic layers, in order to be able to, e.g., set

the cross-coupling (which may be desirable in some instances ~~according to the invention~~) to the desired value.

Please replace the paragraph beginning at page 13, line 15 with the following amended paragraph:

The areas available for the individual components are generally determined by interlayer contacting points, and by the other elements present or realized ~~[sic]~~ in the same plane. This ~~The invention~~ enables particularly good matching for an area which is available and has any given form and shape.

Please replace the paragraph beginning at page 11, line 18 with the following amended paragraph:

Fig. 6 is a schematic plan view of two parts of ~~an inventive~~ a transmission line, which parts are disposed in respective superposed conductor planes (LE1, LE2). The interconnection of the parts of the transformation line corresponds to that of Fig. 1. There are mutually parallel superposed regions 1, 2, and 3; the area of overlap is adjusted such that at a particular operating frequency the transformation line is electrically matched at, e.g., a phase shift of 180□ and an impedance of 50 Ohm.

Please replace the paragraph beginning at page 14, line 16 with the following amended paragraph:

Also possible, in a refinement of the embodiments described herein ~~invention~~ (not illustrated), is for the conductor to have a uniform width over its entire length, wherewith the overlapping areas of mutually parallel conductor segments which are disposed in different conductor planes and which segments partially overlap are determined solely by the mutual displacements of said segments.